In the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) An audio conference server (ACS) for enabling an application program to provide multi-point, weight controllable audio conferencing, the ACS comprising:

means for managing at least one audio conference, said at least one audio conference including a plurality of audio clients;

means for receiving audio data from said plurality of audio clients;

means for mixing said audio data to provide spatialized audio to said plurality of audio clients in said at least one audio conference

wherein said mixing means includes means for providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay characteristics, each different sound decay characteristic providing a different volume/distance relationship,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior, and

wherein said mixing means results in mixed audio data; and

means for delivering said mixed audio data to said plurality of audio clients in said at least one audio conference.

2. (Canceled)

3. (Original) The ACS of claim 1, further comprising means for checking the status of a registered owner of said at least one audio conference to determine whether said at least one audio conference still exists.

4. (Original) The ACS of claim 3, wherein said checking means includes a resource audit service, said resource audit service operable when said at least one audio conference is generated by a first application and is being used by a second application.

5. (Original) The ACS of claim 1, wherein said plurality of audio clients includes set-top box (STB) audio clients and point source audio (PSA) audio clients.

6. (Original) The ACS of claim 1, wherein said managing means comprises an ACS shell to allow a user to interactively interface with said ACS, said ACS shell including:

means for providing program access to high level methods for creating and managing a proxy audio conference;

means for providing program access to methods for creating and managing a plurality of PSA audio clients; and

means for providing program access to low level methods for creating and managing said at least one audio conference.

7. (Currently Amended) An audio conference server (ACS) for enabling an application program to provide multi-point, weight controllable audio conferencing, the ACS comprising:

means for managing at least one audio conference, said at least one audio conference comprising a plurality of audio clients;

means for receiving audio data from said plurality of audio clients;

means for mixing said audio data to provide spatialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing means includes means for providing distance-based attenuation

according to sound decay characteristics,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior, and

wherein said mixing means results in mixed audio data; and

means for delivering said mixed audio data to said plurality of audio clients in said at least one audio conference;

wherein said means for providing distance-based attenuation according to sound decay characteristics comprises:

means for identifying a decay factor from one of a plurality of pre-defined decay factors and a customized decay factor for each of said plurality of audio clients, said plurality of pre-defined decay factors including

an audio big decay factor,

an audio small decay factor,

an audio medium decay factor, and

a constant decay factor;

means for determining distances between a target audio client and a plurality of source audio clients;

means for determining a plurality of weighted values for each of said source audio clients based on said identified decay factor and said distance between each of said source audio clients and said target audio client, wherein each of said weighted values corresponds to a source/target audio client pair;

means for generating a mix table for each of said source/target audio client pairs;

means for calculating an actual mix for said target audio clients; and

means for refining said actual mix for said target audio clients.

8. (Original) The ACS of claim 7, wherein said refining means comprises:

a gain control function to avoid transmitting excess energy audio data;

a fade in/fade out function to avoid the delivery of said audio data in a step-wise manner to a speaker output;

a floating point operation elimination function to avoid the performance of floating point multiplication;

a mixing adaption function to adapt the actual mix calculation for said target audio client to available CPU resources;

a mixing cut-off function to select the nearest talking audio clients for the actual mix; and

a stream audio function to prepare stream audio for playing ambient background music or using an audio source forwarded from another conference.

9. (Currently Amended) A method for enabling an audio conference server ACS to provide an application program with multi-point, weight controllable audio conferencing, comprising:

(1) managing at least one audio conference, said at least one audio conference comprising a plurality of audio clients;

(2) receiving audio data from said plurality of audio clients;

(3) mixing said audio data to provide spatialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing means includes providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay characteristics, each different sound decay characteristic providing a different volume/distance relationship,

<u>wherein said sound decay characteristic may take into account decay characteristics</u>

according to a sound's behavior, and

wherein said mixing results in mixed audio data; and

(4) delivering said mixed audio data to said plurality of audio clients in said at least one audio conference.

10. (Canceled)

11. (Previously Presented) The method of claim 9, further comprising checking the status of a registered owner of said at least one audio conference to determine whether said at least one audio conference still exists.

12. (Previously Presented) The method of claim 11, wherein said checking includes a resource audit service, said resource audit service operable when said at least one audio conference is generated by a first application and is being used by a second application.

13. (Original) The method of claim 9, wherein said plurality of audio clients includes set-top box (STB) audio clients and point source audio (PSA) audio clients.

14. (Previously Presented) The method of claim 9, wherein said managing comprises providing program access to high level methods for creating and managing a proxy audio conference using an ACS shell.

15. (Previously Presented) The method of claim 9, wherein said managing comprises providing program access to methods for creating and managing said point source audio using an ACS shell.

16. (Previously Presented) The method of claim 9, wherein said managing comprises providing program access to low level methods for creating and managing said at least one audio conference using an ACS shell.

17. (Currently Amended) A method for enabling an audio conference server (ACS) to provide an application program with multi-point, weight controllable audio conferencing, comprising:

(1) managing at least one audio conference, said at least one audio conference comprising a plurality of audio clients;

(2) receiving audio data from said plurality of audio clients;

(3) mixing said audio data to provide specialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing includes providing distance-based attenuation according to sound decay characteristics,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior, and

wherein said mixing means results in mixed audio data;

(4) delivering said mixed audio data to said plurality of audio clients in said at least one audio conference;

wherein providing distance-based attenuation according to sound decay characteristics comprises:

identifying a decay factor from one of a plurality of pre-defined decay factors and a customized decay factor for each of said plurality of audio clients, said plurality of pre-defined decay factors including

an audio big decay factor,

an audio small decay factor,

an audio medium decay factor, and

a constant decay factor;

determining distances between a target audio client and a plurality of source audio clients;

determining a plurality of weighted values for each of said source audio clients based on said identified decay factor and said distance between each of said source audio client and said target audio client, wherein each of said weighted values corresponds to a source/target audio client pair;

generating a mix table for each of said source/target audio client pairs;

calculating an actual mix for said target audio clients using said mix table; and

refining said actual mix for said target audio clients, wherein said refining step is used to avoid transmitting excess energy audio data, avoid the delivery of said audio data in a step-wise manner to a speaker output, avoid the performance of floating point multiplication, adapt the actual mix calculation for said target audio client to available CPU resources, select the nearest talking audio clients for the actual mix, and prepare stream audio for playing ambient background music or using an audio source forwarded from another conference.

18. (Currently Amended) A computer program product comprising a computer useable medium having computer program logic recorded thereon for enabling an audio conference server (ACS) to provide an application program with multi-point, weight controllable audio conferencing, said computer program logic comprising:

means for enabling the computer to manage at least one audio conference, said at least one audio conference comprising a plurality of audio clients;

means for enabling the computer to receive audio data from said plurality of audio

clients;

means for enabling the computer to mix said audio data to provide spatialized audio to said plurality of audio clients in said at least one audio conferences;

wherein said mixing means includes means for enabling the computer to provide distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay characteristics, each different sound decay characteristic providing a different volume/distance relationship,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior, and

wherein said mixing means results in mixed audio data; and

means for enabling the computer to deliver said mixed audio data to said plurality of audio clients in said at least one audio conference.

19. (Canceled)

20. (Original) The computer program product of claim 18, further comprising means for enabling the computer to check the status of a registered owner of said at least one audio conference to determine whether said at least one audio conference still exists.

21. (Original) The computer program product of claim 20, wherein said means for enabling the computer to check the status of a registered owner of said at least one audio conference includes a resource audit service, said resource audit service operable when said at least one audio conference is generated by a first application is being used by a second application.

22. (Original) The computer program product of claim 18, wherein said plurality of audio clients includes set-top box (STB) audio clients and point source audio (PSA) audio clients.

23. (Original) The computer program product of claim 18, wherein said means for enabling the computer to manage at least one audio conference comprises means for enabling the computer to provide an ACS shell to allow a user to interactively interface with said ACS, said ACS shell including:

means for enabling the computer to provide program access to high level methods for creating and managing a proxy audio conference;

means for enabling the computer to provide program access to methods for creating and managing a plurality of point source audio (PSA) audio clients; and

means for enabling the computer to provide program access to low level methods for creating and managing said at least one audio conference.

24. (Currently Amended) A computer program product comprising a computer usable medium having computer program logic recorded thereon for enabling an audio conference server (ACS) to provide an application program with multi-point, weight controllable audio conferencing, said computer program logic comprising:

means for enabling the computer to manage at least one audio conference, said at least one audio conference comprising a plurality of audio clients;

means for enabling the computer to receive audio data from said plurality of audio clients;

means for enabling the computer to mix said audio data to provide specialized audio to said plurality of audio clients in said at least one audio conferences,

wherein said mixing means includes means for enabling the computer to provide distance-based attenuation according to sound decay characteristics,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior, and

wherein said mixing means results in mixed audio data; and

means for enabling the computer to deliver said mixed audio data to said plurality of audio clients in said at least one audio conference;

wherein said means for enabling the computer to provide distance-based attenuation according to sound decay characteristics comprises:

means for enabling the computer to identify a decay factor from one of a plurality of pre-defined decay factors and a customized decay factor for each of said plurality of audio clients, said plurality of pre-defined decay factors including

an audio big decay factor,

an audio small decay factor,

an audio medium decay factor, and

a constant decay factor;

means for enabling the computer to determine distances between a target audio client and a plurality of source audio clients;

means for enabling the computer to determine a plurality of weighted values for each of said source audio clients based on said identified decay factor and said distance between said source audio client and said target audio client, wherein each of said weighted values corresponds to a source/target audio client pair;

means for enabling the computer to generate a mix table for each of said source/target audio client pairs;

means for enabling the computer to calculate an actual mix for said source audio clients;

and

means for enabling the computer to refine said actual mix for said source audio clients.

25. (Original) The computer program product of claim 24, wherein said means for enabling the computer to refine said actual mix for said source audio clients comprises:

means for enabling the computer to provide a gain control function to avoid transmitting excess energy audio data;

means for enabling the computer to provide a fade in/fade out function to avoid the delivery of said audio data in a step-wise manner to a speaker output;

means for enabling the computer to provide a floating point operation elimination function to avoid the performance of floating point multiplication;

means for enabling the computer to provide a mixing adaption function to adapt the actual mix calculation for said target audio client to available CPU resources;

means for enabling the computer to provide a mixing cut-off function to select the nearest talking audio clients for the actual mix; and

means for enabling the computer to provide a stream audio function to prepare stream audio for playing ambient background music or using an audio source forwarded from another conference.

26. (Previously Presented) An audio conferencing method comprising:

receiving audio data from a source audio client;

attenuating the received audio data based on audio decay characteristics to simulate a distance between the source audio client and a target audio client; and

delivering the attenuated audio data to the target audio client.

27. (Previously Presented) The method of claim 26, wherein the target audio client is the same as the source audio client.

28. (Previously Presented) The method of claim 26, wherein the target audio client is different than the source audio client.

29. (Previously Presented) The method of claim 28, further comprising delivering the attenuated data to the source audio client.

30. (Previously Presented) The method of claim 26, wherein the source and target audio clients are displayed as points on a viewing screen from which sound appears to emanate.

31. (Previously Presented) The method of claim 30, wherein the source audio client comprises a point source audio (PSA) client that originates from stored audio data.

32. (Previously Presented) The method of claim 31, wherein the PSA includes point sources of sound from a file or user input.

33. (Previously Presented) The method of claim 30, wherein the source audio client comprises a set-top box (STB) audio client the originates from an audio conferencing user.

34. (Previously Presented) The method of claim 33, wherein the STB includes a set-top application for controlling audio data from a microphone or speaker.

35. (Previously Presented) The method of claim 30; wherein the target audio client comprises a set-top box (STB) audio client that originates from an audio conferencing user.

36. (Previously Presented) The method of claim 35, wherein the STB includes a set-top application for controlling audio data from a. microphone or speaker.

37. (Previously Presented) The method of claim 26, wherein a plurality of audio clients participate in an audio conference.

38. (Previously Presented) The method of claim 26, further comprising managing one or more audio conferences using an Interface Definition Language (IDL) that creates and deletes conferences, adds and removes participants to and from the conferences, and changes a volume balance among participants in the conferences.

39. (Previously Presented) The method of claim 26, wherein attenuating comprises identifying a decay factor for each audio client.

40. (Previously Presented) The method of claim 39, wherein the decay factor is a customized decay factor.

41. (Previously Presented) The method of claim 39, wherein attenuating further comprises determining a weighted value between the source audio client and the target audio client based on- the source
audio client's decay factor.

42. (Previously Presented) The method of claim 41, wherein attenuating further comprises calculating a mix for the audio clients using the weighted values.

43. (Previously Presented) The method of claim 42, wherein attenuating further comprises refining the mix for the audio clients by adjusting a plurality of audio data functions such as gain control, fade in/fade out, floating point operation elimination, mixing adaption, mixing cut-off, and stream audio.

44. (Previously Presented) Computer software, stored on a computer-readable medium, for an audio conference server (ACS), the software comprising instructions for causing a computer processor to perform the following operations:

receive audio data from a source audio client;

attenuate the received audio data based on audio decay, characteristics to simulate a distance between the source audio client and a target audio client; and

deliver the attenuated audio data to the target audio client.

45. (Currently Amended) An audio conference server providing multi-point, weight controllable audio conferencing comprising:

a management device managing at least one audio conference, said at least one audio conference including a plurality of audio clients;

a receiver receiving audio data from said plurality of audio clients;

a mixer mixing said audio data from said plurality of audio clients;

wherein said mixer includes a distance-based attenuation device providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay

characteristics, each different sound decay characteristic providing a different volume/distance relationship,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior, and

wherein said mixer provides mixed audio data; and

an audio data delivery device delivering said mixed audio data to said plurality of audio clients in said at least one audio conference.

46. (Currently Amended) An audio conference server providing multi-point, weight controllable audio conferencing comprising:

a management device managing at least one audio conference, said at least one audio conference including a plurality of audio clients;

a receiver receiving audio data from said plurality of audio clients;

a mixer mixing said audio data from said plurality of audio clients;

wherein said mixer includes a distance-based attenuation device providing distance-based attenuation according to sound decay characteristics,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior, and

wherein said mixer provides mixed audio data,

wherein said distance-based attenuation device includes:

an identification device identifying a decay factor from one of a plurality of pre-defined decay factors and a customized decay factor for each of said plurality of audio clients, said plurality of pre-defined decay factors including:

an audio big decay factor,

an audio small decay factor,

an audio medium decay factor, and

a constant decay factor,

a distance determining device determining a distance between a target audio client and a plurality of source audio clients,

a weighted value determining device determining a plurality of weighted values for each of said source audio clients based on said identified decay factor and said distance between each of said source audio clients and said target audio client, wherein each of said weighted values corresponds to a source/target audio client pair,

a mix table generator generating a mix table for each of said source/target audio client pairs,

a calculator calculating an actual mix for said target audio clients, and

a refining device refining the actual mix for said target audio clients; and

an audio data delivery device delivering said mix audio data to said plurality of audio clients in said at least one audio conference.

47. (Currently Amended) A computer executable code for an audio conference server providing multi-point, weight controllable audio conferencing, said code comprising:

a managing section enabling management of at least one audio conference, with said at least one audio conference including a plurality of audio clients;

a receiving section enabling reception of audio data from said plurality of audio clients;

a mixing section enabling the audio conference server to provide spatialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing section includes a distance-based attenuation section providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay

characteristics, each different sound decay characteristic providing a different volume/distance relationship,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior, and

wherein said mixing section results in mixed audio data; and

a delivery section enabling delivery of said mixed audio data to said plurality of audio clients in said at least one audio conference.

48. (Currently Amended) A computer executable code for an audio conference server providing multi-point, weight controllable audio conferencing, said code comprising:

a managing section enabling management of at least one audio conference, said at least one audio conference comprising a plurality of audio clients;

a receiving section enabling reception of audio data from said plurality of audio clients;

a mixing section enabling mixing of said audio data to provide spatialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing section includes a distance-based attenuation section enabling distance-based attenuation according to sound decay characteristics,

wherein said sound decay characteristic may take into account decay characteristics according to a sound's behavior,

wherein said mixing section results in mixed audio data,

wherein said distance-based attenuation section includes:

an identification section enabling identification of a decay factor from one of a plurality of pre-defined decay factors and a customized decay factor for each of said plurality of audio clients, with said plurality of pre-defined decay factors including:

an audio big decay factor,

an audio small decay factor;

an audio medium decay factor, and

a constant decay factor;

a distance determining section enabling determination of distances between a target audio client and a plurality of source audio clients,

a weighted value section enabling determination of a plurality of weighted values for each of said source audio clients based on said identified decay factor and said distance between said source audio client and said target audio client, where each of said weighted values corresponds to a source/target audio client pair,

a mix table section enabling generation of a mix table for each of said source/target audio client pairs,

a calculation section enabling refinement of said actual mix for said target audio clients, and

a refining section enabling refinement of said actual mix for said target audio clients; and

a delivery section enabling delivery of said mixed audio data to said plurality of audio clients in said at least one audio conference.